Prairie Wetlands Learning Center

Wild Work

Method	Students will meet a professional employee working at the Prairie Wetlands Learning Center for the U.S. Fish and Wildlife Service. They will mix-and-match wildlife careers with their descriptions and complete and score a wildlife career survey to determine the types of wildlife careers they may enjoy. They will watch a brief U.S. Fish and Wildlife Service recruitment video and find out about conservation careers in the Fergus Falls Wetland Management District. Finally, students will determine how to handle a real-life issue through a role play activity as staff members of a field office in the U.S. Fish and Wildlife Service.
Performance Objectives	After completing this activity, students will be able to… • Name and describe three wildlife careers. • Acknowledge that they can choose a career that can help wildlife directly or indirectly. • Identify their wildlife career personality profile. • Describe the role of the U.S. Fish and Wildlife Service in fish and wildlife careers.
Materials To be provided at the program (not included in this lesson plan).	Clipboards & pencils Career cards and answer sheet What's Your Preference? wildlife profile surveys Career Profile Scoring Sheets and Wildlife Career Profiles sheets On the Job sheets (1 set per class/group) USFWS and NWRS mission statement posters Station fact sheets and station role playing cards (classroom sets) Station issue background sheets (classroom set) Station issue results (staff copy) FFWMD vegetation map, historic vegetation map, grassland map FFWMD prairie chicken map, Bah Lakes locator map and WPAs locator map HAPET woody vegetation fact sheet and waterfowl nesting density map FFWMD brochures (classroom set) Bah Lakes WPA before and after photos NW Minnesota Moose Population chart, moose hide, liver fluke, scat, and radio collar Winter Deer Tick and Deer Liver Fluke handouts Adopt-a-Moose program and Moose Research Design handouts Tamarac visitor use statistics, comments from guest book Tamarac Refuge maps (team set) and hunting map and regulations MN Valley maps (team set) U.S. Fish and Wildlife Service recruitment VHS video TV/VCR and overhead projector and screen Careers with the U.S. Fish and Wildlife Service brochures Poster or overhead of wildlife careers in the Fergus Falls Wetland Management District
Subjects	Careers, social studies
MN	9th – 12th Grades: Science (I.C, III.A.1, III.C.4), Language Arts (I.B, I.C, III), Social

Academic Standards	Studies (Geography V.D.1, V.D.3, Government and Citizenship VII.A.4)
Time	One hour
Seasons	Any
Setting	School classroom
Grade Range	9-12
Group Size	One classroom
Skills	Matching, values clarification, decision-making, scoring, observation, listening, modeling, role-playing, discussing, public speaking
Vocabulary	Job, career, volunteer, internship/intern, ecotourism, lobbyist, government agency, non-profit organization, corporation or business, Peace Corps, AmeriCorps, endangered species, conservation, prescribed fire, issue, mitigation, management, supervision, leadership

This program uses materials provided by PWLC staff in part from Windows on the Wild - Wildlife For Sale developed by the World Wildlife Fund and a component of the U.S. Fish and Wildlife Service's Suitcase for Survival. The role-playing activity in this lesson plan includes real jobs and issues but fictitious personal information.

Background Information

"The face and character of our country are determined by what we do with America and its resources." Thomas Jefferson

The purpose of this program is to increase awareness of wildlife careers and to increase awareness of America's Refuge System and the U.S. Fish and Wildlife Service as an employer for fish and wildlife careers.

From the Arctic Ocean to the Caribbean, from the South Pacific to the Atlantic Ocean, Service personnel are working to ensure that future generations of Americans will be able to enjoy nature's beauty and bounty. Following a tradition of conservation leadership that is now in its second century, the U.S. Fish & Wildlife Service plays a pivotal role in safeguarding some of this nation's rich natural resources. It is a challenge that is growing more complex every year.

The U.S. Fish and Wildlife Service employs more than 7,500 people, men and women representing a diverse range of backgrounds in more than 120 occupations and *working*

together to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. (The mission of the Service is italicized.)

To accomplish its mission, the Service employs many of the country's best biologists, wildlife managers, engineers, realty specialists, educators, law enforcement agents, and others who work to save threatened and endangered species, manage millions of acres of wildlife lands, conserve migratory birds and inland fisheries, restore habitats, and provide expert conservation advice to other federal agencies, industry, private citizens, and foreign governments. The Service manages more than 700 offices and field stations (such as the Prairie Wetlands Learning Center) including over 3,000 Waterfowl Production Areas, over 545 National Wildlife Refuges, 69 National Fish Hatcheries raising over 150,000,000 fish per year, seven regional offices, the Washington D.C. headquarters office, the National Conservation Training Center, and field offices for law enforcement, ecological services, and private lands.

The Prairie Wetlands Learning Center employs six full-time, permanent employees. The Center is part of the Fergus Falls Wetland Management District which employs an additional 12 full-time, permanent employees; two full-time career-seasonal employees; one part-time, temporary employee; five full-time, temporary employees; three temporary full-time Student Temporary Experience Program employees; and one full-time, seasonal Student Career Experience Program employee. Within the District, jobs vary and include the following: manager, administrative officer, office assistant, wildlife biologist, maintenance mechanic, trapper, biological science technicians (wildlife and private lands), park ranger, fire management officer, and range technicians. Some of the positions work directly with wildlife, while others work indirectly to benefit the resource. Some work is exclusively indoors, while others work primarily outside, or a combination of both.

Other U.S. Fish and Wildlife Service employees whose scope reaches beyond the local area are co-located in the District's headquarters including the Fergus Falls Wetland Acquisition office and the Habitat and Population Evaluation Team (HAPET). The Wetland office is responsible for realty negotiations in the Minnesota Waterfowl Production Areas Program (Morris, Fergus Falls, and Detroit Lakes Wetland Management Districts) and in Glacial Ridge National Wildlife Refuge (NWR), Big Stone NWR, Neal Smith NWR (in Iowa), and Hamden Slough NWR.

HAPET is part of the Migratory Bird Division of the Service. HAPET provides biological support to Service Wetland Management Districts and National Wildlife Refuges in the prairie pothole regions of Minnesota and Iowa. They also lend their support and partner with several conservation agencies and organizations. HAPET employees include four permanent full-time positions such as team leader, biologists, and biological science technician. Depending on current projects and funding, HAPET employs at least one seasonal biological technician - some years as many as ten.

Employment and operations in the District headquarters contributes to the local

economy of Fergus Falls and to the preservation, protection, and restoration of the prairie pothole region.

The Service recruits new, high quality employees through the Student Career Experience Program and the Student Temporary Experience Program.

Teacher Preparation

Photocopy the background information for students to read. Allow students to visit the U.S. Fish and Wildlife Service's employment web sites to start becoming familiar with careers in fish and wildlife. For information or vacancy announcements, visit www.usajobs.opm and http://jobs.fws.gov/. Together, brainstorm a list of wildlife careers. Use the background info and web sites to answer basic career questions such as: What kind of advanced education is required to qualify for some positions in the Service? Which positions do not require a college degree? Where geographically are jobs located in the Service? What is the entry level pay and advanced pay? Does the federal government provide benefits like relocation services, retirement plans, and medical insurance? Are any seasonal positions currently available locally?

Procedure

1. Ask students to describe their anticipated career path. (Listen to responses.) They can also consider choosing a career that helps the environment. In reality, every job may directly or indirectly impact the environment in a positive or negative way. Introduce yourself as an employee of the Prairie Wetlands Learning Center, managed by the U.S. Fish and Wildlife Service. In the Service, more than 7,500 people men and women in more than 120 occupations are working to specifically help fish and wildlife.

2. Explain that they are going to take a closer look at wild work: what some of the jobs are, which types of jobs they would be best suited for, and they will role play one position. Hopefully this program will help them decide if a wildlife career is in their future.

3. Lead students through the career cards mixer activity. Students mix and match a variety of wildlife careers with their descriptions and discuss how each particular career might help wildlife or the environment. They then report on their career as they read their cards to the class or within a small group.

4. Facilitate the wildlife careers profile. Students complete and score a brief survey to determine the types of jobs they might enjoy.

5. Show students the U.S. Fish and Wildlife Service college recruitment video so they can observe examples of fish and wildlife careers.

6. Split students into small groups which represent staffs for various Service field stations. Provide each group with staff role cards, scenario summaries, station fact

sheets, and appropriate props. Students should read over all of their information. They should read their staff card aloud to their group, and discuss and determine how they will handle the situation using the questions provided as a guide. Each group should select one person to summarize their scenario and solution to the class. (Written materials for these scenarios are included in this lesson plan.)

7. Remind students that we all can make a difference for wildlife directly or indirectly by our career choice! Hopefully they've had a wild time learning about wild work, and this program helped them further clarify their intended career path.

Teacher-Led Extensions/Adaptations/Assessment Ideas

- Study vocabulary words.
- Students research their wildlife career as determined by the profile.
- Students conduct an interview in person or by phone with a wildlife professional. For a lesson plan, see "Career Moves" in World Wildlife Fund's curriculum Windows on the Wild, Biodiversity Basics.
- Students legitimately interested in fish and wildlife career may be able to job shadow a wildlife professional. Contact the Fergus Falls Wetland Management District office to explore the possibilities. Phone: 218-736-2291.
- Students may also be able to volunteer to gain experience. Contact the District's volunteer coordinator at 218-736-0938.
- Students write career profiles of people in their community.
- Visit Internet to learn more including college sites and government agency web sites - US Fish and Wildlife Service, Minnesota Department of Natural Resources, National Forest Service, National Park Service, Natural Resource Conservation Service, National Park Service, and Bureau of Land Management.
- Listen to Collaboration, The Salmon Song, Song of the System, I'm a Fish, Disappearing Eider Blues, and Windows/Passages on the Songs of the System music cd. Fish and Wildlife Man is especially appropriate.

Resources

Windows on the Wild, Biodiversity Basics. (1999) World Wildlife Fund.

Windows on the Wild, Wildlife For Sale*, An Educators Guide to Wildlife Trade.* (2001) World Wildlife Fund.

Songs of the System music compact disc, Friends of Forsythe National Wildlife Refuge, http://www.friendsofforsythe.org

http://www.fws.gov/midwest/agassiz/documents/MooseSurvey.pdf Northwest Minnesota Moose Mystery Research Report
http://www.fws.gov/midwest.Agassiz/moosesite/dead Statistics on Moose Deaths

http://www.fws.gov/midwest/Agassiz/moosesite/design Moose Research Design

http://www.fws.gov/midwest/Agassiz/moosesite/adopt Adopt-A-Moose Program

http://www.fws.gov/midwest/Agassiz/moosesite/wintick The Winter Deer Tick

http://www.fws.gov/midwest/Agassiz/moosesite/fluke The Deer Liver Fluke

http://www.bls.gov/oco U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook

http://www.iwaswondering.org/index2 Women's Adventures in Science

Credits

This lesson is based upon the Wild Work lesson originated from Horicon National Wildlife Refuge, U.S. Fish and Wildlife Service, and modified by the Prairie Wetlands Learning Center staff.

Thank you to the following employees in the U.S. Fish and Wildlife Service who contributed to the development of this modified version:

Tamarac National Wildlife Refuge: Kelly Blackledge and Janice Bengston
Aggasiz National Wildlife Refuge: Maggie Anderson
Minnesota Valley National Wildlife Refuge: Linda Malz, Mara Koenig, and Tom Kerr
Fergus Falls Wetland Management District: Penny Petersen, Stacy Salvevold, Doug Wells, Laura Bonneau, Teresa Jaskiewicz, Molly Stoddard, Ken Garrahan, and Kevin Brennan
Habitat and Population Evaluation Team: Tony Rondeau

Thank you also to Lori Nelson, Friends of Minnesota Valley.

Worksheets, materials, and additional information are available from *Windows on the Wild - Wildlife For Sale* by the World Wildlife Fund.

Station: Fergus Falls Wetland Management District (District)
Project: Grassland Habitat Management
Issue: Removal of Woody Vegetation

Background:

For several years, the U.S. Fish and Wildlife Service has been working with the Minnesota Department of Natural Resources, The Nature Conservancy, Brandenburg Foundation and other partners to restore and protect the vanishing northern tallgrass prairie in western Minnesota and northern Iowa. Estimates place the original tallgrass prairie in Minnesota and Iowa at 25 million acres. Today, only about 300,000 acres remain in the two states, representing a greater than 99 percent decline. Currently, only a small percentage of northern tallgrass prairie habitats are protected, making it one of the rarest and most fragmented ecosystems in America.

Historically, larger grasslands dominated the landscape. Over time, humans fragmented the landscape with roads, buildings, fence rows, and wood lots. Fragmentation favored the geographic expansion of medium-sized and efficient nest predator populations like raccoon, skunk, and fox into areas they did not inhabit historically. Humans also removed larger predators like grizzly bears and wolves which would have preyed on medium-sized predators, keeping their numbers in balance. The mere presence of trees deters some species from nesting in grasslands because they make suitable hunting perches for predators including raptors. Humans have also mostly eliminated the presence of fire in the landscape which historically kept invading trees in check.

Wildlife biologists and land managers with the District are considering how to deal with scattered trees and woody vegetation that are threatening to overtake tracts of tallgrass prairie habitat in western Minnesota. The trees did not exist historically there. The non-native tree species mostly include Russian olive, Siberian elm and European buckthorn. The tree species native to North America include green ash and cottonwood. All of these trees combine with woody shrubs to provide cover for efficient nest predators which threaten waterfowl, prairie chicken, and other non-game bird species. These wildlife species also depend on large open grasslands to thrive.

For many people who live on the spacious prairies of western Minnesota, planting a tree can be a personal statement about their conservation ethic. District staff are confronted by a new challenge: educating the public on why removing trees from a prairie landscape can actually be good for wildlife.

Your team represents the staff of the Fergus Falls Wetland Management District. As a team, review and discuss the information provided about Bah Lakes Waterfowl Production Area (WPA). As the name suggests, the main objective of WPAs is **waterfowl production**. Discuss and answer the following questions together. Select one or two staff to report your answers to the whole class.

1. **What will you do about trees on Bah Lakes WPA?** You can be creative but also realistic.
2. **Why?** Be sure to remember the mission of the Refuge System, the purpose of your station, public safety, and scientific justification.
3. **Explain how each staff person will be involved.**

Fergus Falls
Wetland Management District

21932 State Highway 210 East
Fergus Falls, MN 56537 – 7627

Visit the District's Web Site:
http://midwest.fws.gov/fergusfallswetland

The Fergus Falls Wetland Management District boasts some of the highest densities of breeding waterfowl in Minnesota.

Overview

Fergus Falls Wetland Management District

The Fergus Falls Wetland Management District (District) was established in 1962. It includes the counties of Douglas, Grant, Otter Tail, Wadena and Wilkin.

The mission of the District is to identify, protect, and restore the tallgrass prairie/wetland ecosystem and associated habitats and to provide opportunities for outdoor recreation and environmental education.

For this purpose, the District currently manages 215 **Waterfowl Production Areas (WPAs)** totaling 43,962 acres, and 1,101 acres of perpetual easements protecting 21,909 acres of wetlands on private land. Forty-six perpetual wildlife habitat easements covering 3,350 acres of native and non-native habitats on private land have also been obtained. Townsend WPA is the home of the Prairie Wetlands Learning Center, all part of the District.

Getting There . . .

Take I-94 to State Highway 210 East (Exit 57) and travel east one mile to the Prairie Wetlands Learning and three miles to the headquarters.

Wildlife and Habitat

The variety of habitats within the District promotes a diversity and abundance of wildlife species that changes with the seasons. The importance of wetlands to waterfowl is obvious and well known by wildlife biologists. Equally essential, however, is the adjacent grassland vegetation near wetlands that serves as preferred nesting habitat for waterfowl and other ground nesting birds like pheasants and many grassland songbirds. The District boasts some of the highest densities of breeding waterfowl in Minnesota.

Over 293 species of birds have been observed, and about 170 species nest within the District. Remnant native grasslands in the western part of the District are good places to experience the tallgrass prairie community with its diverse assortment of plants and insects. These are also good places to see greater prairie chickens, marbled godwits, and short-eared owls.

Approximately 45 pairs of bald eagles and nearly a dozen ospreys nest in the District. This avian diversity is complimented by at least 40 species of mammals and 25 species of reptiles and amphibians.

History

Historically, this portion of western Minnesota was broad, sweeping grassland known as the Northern Tallgrass Prairie. Interspersed throughout this open landscape was an abundance of wetlands in every shape and size imaginable. This "prairie pothole country" was a literal duck factory - producing mallards, blue-winged teal, canvasbacks, and other waterfowl by the millions.

Agricultural changes to the landscape included the loss of most native prairie and the drainage of over 50 percent of the small wetlands. District staff are working to restore and protect wetlands and their associated prairie.

Management Activities

Habitat management activities on waterfowl production areas focus on the restoration and maintenance of grasslands and associated wetlands for the benefit of waterfowl and other migratory birds. Tools available to the wetland manager include prescribed fire, water level manipulation, waterfowl nesting structures, mowing, tree and brush removal, haying and grazing, where appropriate.

The District is heavily involved in private lands activities and has formed effective partnerships to restore and/or enhance drained wetlands and some grasslands within the five-county working area. With landowner approval, bulldozers and backhoes are used to plug drainage ditches, break drain tiles, and install water control structures to maintain desired water levels of the wetlands. In time, wetlands, once drained and forgotten, can be revived to carry on their vital role as part of the prairie landscape.

Recreation & Education Opportunities

Environmental Education

The Prairie Wetlands Learning Center, a residential environmental education center which focuses its education efforts on the ecology of the Prairie Pothole Region, is located on the Townsend WPA adjacent to the City of Fergus Falls. The Center contains over 325 acres of native and restored prairie, 28 wetlands, and nearly four miles of foot trails. Environmental education specialists offer a variety of programs and classes for schools, scouts, and other organized groups, as well as the general public.

The Center also features an 80-bed dormitory and kitchen, allowing groups to spend several days learning about the prairie pothole ecosystem.

Fishing

Although fishing opportunities are abundant in the area, limited fishing opportunities exist on District lands. Contact the District office for more information.

Hunting

WPAs are public lands and are open to hunting, except where posted "Closed." The Prairie Wetlands Learning Center (Townsend WPA), District office, and maintenance shop lands are permanently closed to hunting, and several other WPAs are temporarily closed. The District website lists those WPAs that are closed.

Interpretation

Interpretive programs and special events are offered year round at the Prairie Wetlands Learning Center. In addition to providing interpretive and environmental education programs, the Center is a Prairie Passage site and part of the Minnesota River Birding Trail and the Pine to Prairie Birding Trail.

Wildlife Observation and Photography

The District is an excellent place to observe and photograph waterfowl and other water birds. The best time to see the widest variety of birds is typically between the second and third weeks in April when waterfowl begin to congregate in large numbers as frozen wetlands become free of ice. Egrets, herons, grebes, loons, and cormorants are abundant.

Station: Fergus Falls Wetland Management District (District)
Project: Grassland Habitat Management
Issue: Removal of Woody Vegetation

Roles:

Maintenance Worker

As a maintenance worker for the U.S. Fish and Wildlife Service, you are responsible for everything from creating trails and operating heavy equipment to installing wiring and maintaining Service vehicles. You work with the refuge operations specialist to carry out management activities. You are trained in chainsaw operation, and work with the fire crew to manage prescribed fires. You are a member of the Fergus Falls Sportsman's Club, and look forward to hunting deer with your friends each fall. Sometimes you and your friends hunt in the wood lots on the District's Waterfowl Production Areas.

Refuge Operations Specialist

As a refuge operations specialist for the U.S. Fish and Wildlife Service, you work with wildlife biologists and the district manager to manage prairie and woodland habitat. You are responsible for prairie restoration and maintenance including harvesting seed, seeding grasslands, and controlling weeds. At the Fergus Falls Wetland Management District, you work with wildlife biologists and the district manager to make management decisions and apply techniques based on sound scientific information and knowledge of historic vegetation

Materials: vegetation map, historic vegetation map, grassland map

District Manager

District managers are experts in wildlife and habitat protection and restoration. You use the best science and technology to monitor and care for wildlife, use a range of land management techniques to ensure suitable habitat, and work to provide the public with opportunities for wildlife-dependent recreation. You spend a lot of time meeting with private residents who live near the District, community organizations, and other partners to represent the interests of wildlife in land-use planning and development. As district manager, you have the **final say** in questions of Refuge management and regulations. Though you have lived in Fergus Falls for most of your life and know many residents personally, it is your responsibility to address each situation in an unbiased fashion with the best scientific information available. The mission statement of the U.S. Fish and Wildlife Service and the Fergus Falls Wetland Management District are your guides.

Materials: prairie chicken map, Bah Lakes locator map

Ranger

As a ranger for the U.S. Fish and Wildlife Service, your primary responsibility is to educate the community about Service programs and management activities, and lead tours, nature walks, and special events. Your office is at the Prairie Wetlands Learning Center, and you spend much of your time leading educational programs for school groups. You also coordinate your station's volunteer program. You are the public contact, and as such, you answer questions and deal with complaints. As a U.S. Fish and Wildlife Service employee, your first priority is wildlife, but you must also provide good customer service and wildlife-dependent recreation. Many of the volunteers and regular visitors are your friends, and some of them have asked why anyone would want to cut down a tree – what a waste of nature! Aren't trees natural?

Materials: WPAs locator map

Seasonal Fire Technician

Your position with the U.S. Fish and Wildlife Service is seasonal – you only work from April through October, the busy field season. You just graduated from the Forestry program in the College of Natural Resources at the University of Wisconsin-Stevens Point and have extensive experience with a chainsaw. You are enthusiastic about the opportunity to cut trees! You grew up in the Fergus Falls area and know many of the local farmers and sportsmen, and you hear a lot of negative feedback about tree removal in the District. Locals often tell you how excited they are about hunting pheasants and ask why anyone would want to cut down trees and other good pheasant habitat.

Wildlife Biologist (Habitat and Population Evaluation Team or HAPET)

As a wildlife biologist and a member of the U.S. Fish and Wildlife Service's Habitat and Population Evaluation Team, you conduct wildlife population surveys, create biological models using Geographic Information Systems technology, and make management recommendations based on your research. Your particular area of expertise is grassland birds, and you have conducted extensive research on the negative effects of woody vegetation (trees) on grassland songbirds and nesting waterfowl. You are an avid birder and a member of the local Audubon bird watching group.

Materials: HAPET woody vegetation fact sheet and waterfowl nesting density map

Station: Fergus Falls Wetland Management District (District)
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Issue: Removal of Woody Vegetation

Results:

It is the refuge operations specialist's ongoing responsibility to coordinate this project and make recommendations to the district manager and keep him informed of progress. The district manager can change the recommendations anytime and ultimately must approve plans before they can be implemented.

The staff decided to combine tree removal at Bah Lakes Waterfowl Production Area (WPA) with tree removal on 27 WPAs in the District, impacting 3,560 grassland acres. More units are listed for treatment and will be worked on as funding allows. Trees have been removed as a multi-year process starting in 2000 and continuing through 2005 and beyond, six years total.

Tree removal includes entire groves as well as thinly scattered trees. The groves were contracted to an excavating company and bulldozed with heavy equipment provided by the contractor. Seasonal fire technicians employed by the U.S. Fish and Wildlife Service removed scattered trees by chain saw. Downed trees were cut up and/or piled, burned, and buried.

At Bah Lakes WPA in particular, all three groves were removed by bulldozer. The former grove lands were then seeded to native grassland. Scattered chain-sawed stumps were treated with an herbicide to prevent re-growth. The summer fire technicians treated stumps as they cut, and the stumps are treated with Garlon (triclopyr).

Maintenance will continue in 2006 and beyond. Three prescribed fire burn units have been designated on Bah Lakes. According to an approved fire plan, each unit will be burned on a four to six year rotation by the District fire crew which includes the fire technician, maintenance worker, and refuge operations specialist. A regular cycle of prescribed fires conducted by the District fire crew helps keep growth of newly invading trees in check much like fires did prior to American settlement. Visual observations will take place post-burn to see how effectively burning is keeping the remaining and re-sprouting trees under control. Unfortunately, due to other management priorities, formal monitoring will not take place.

In an effort to help educate the public about this issue, news releases were sent to area newspapers by the administrative technician. The refuge operations specialist met with the Soil and Water Conservation District Board of Supervisors for Wilkin and West Otter Tail Counties to explain U.S. Fish and Wildlife Service plans and answer questions. The ranger helped develop this scenario for this lesson.

In a nutshell, this issue represents a landscape problem. The objectives of WPAs come into play because they are not managed specifically for deer hunting habitat. The public's concern is met, in part, by an approach that states that we are not removing trees across the entire District but instead are targeting specific areas.

Materials:

- District brochure as take home item for all students
- Before and after photos: The two north groves are related to the map. Site number 1 in the photos is the NW grove on the map and site #2 is the NE grove. We don't have any pictures of the third site, but those trees have been cut! Any large groups of trees are represented by brown, but there are some scattered trees that we just cannot represent accurately on arc view. Most of what is left on Bah Lakes is not very tall. It is more shrubby growth.

Station: Agassiz National Wildlife Refuge
Project: Moose Management
Issue: Declining Moose Population in Northwest Minnesota

Background:

Moose hunting and viewing have become an important economic supplement to many communities throughout northwest Minnesota. State and Federal biologists in northwest Minnesota have been monitoring moose populations since 1960. **See NW Minnesota Moose Population chart.** The chart indicates populations were cycling naturally for many years, but the population started to decline in 1984. The population never fully recovered to the earlier levels; in fact, the population reached an all time low. Research was started through partnerships formed between the Department of Natural Resources, U.S. Fish and Wildlife Service, universities, local businesses and volunteers.

The research addressed these questions: Why has the moose population declined in northwest Minnesota? Are parasites and disease causing the decline? What roles do humans play? (i.e. hunters, vehicle collisions or loss of habitat) What if anything can be done to increase the population?

Three study areas were selected, and Agassiz National Wildlife Refuge was one of those sites. The research team also included private contractors for pilots, capture and release biologists, and even radio telemetry monitors. After three years of research, results indicated that these three factors played a part in the decline.

First: climatic changes. An increase in air temperatures in March and September was sited, increasing the energy demand for moose to keep cool and causing a disruption of their energy balance.

Second: parasites. Liver flukes, brain worms, and winter ticks created adverse affects in moose. (Winter ticks, found frequently in deer, produced no apparent harmful affects to deer, however.)

Third: element deficiencies. Moose were found to be deficient in the elements copper and selenium resulting in lower reproductive rates.

Your team represents the staff of the Agassiz National Wildlife Refuge. As a team, review and discuss the information provided. Determine what you would do to increase the moose population at Agassiz Refuge. Questions to discuss as a staff and report to whole class:

1. What will you do to restore the moose population? You can be creative but also realistic.

2. Why? Be sure to remember the mission of the Refuge System, the purpose of your station, public safety, and scientific justification.

3. Explain how each staff person will be involved.

Agassiz
National Wildlife Refuge

Marshall County Road 7
Middle River, MN 56737
Visit the Refuge's Web Site:
http://midwest.fws.gov/agassiz

A large Franklin's gull colony of approximately 20,000 breeding pairs is located on the Refuge.

Overview

Agassiz National Wildlife Refuge is located in northwest Minnesota. The Refuge, originally named Mud Lake Migratory Waterfowl Refuge, was established in 1937 primarily for waterfowl production and maintenance. Located in eastern Marshall County, the contiguous 61,500 acres are situated in the aspen parkland region of northwest Minnesota. In 1976, 4,000 acres of the Refuge were designated a Wilderness Area. Each year over 20,000 visitors enjoy wildlife viewing on Agassiz Refuge's self-guided auto tour route and hiking trails.

Today, Agassiz is composed of 40,100 acres of wetlands, 10,000 acres of shrublands, 7,000 acres of forestland, 4250 acres of grassland, and 150 acres of cropland. The Wilderness Area encompasses one of the most westerly extensions of black spruce-tamarack bog in Minnesota. Two lakes in the area were formed by deep peat fires which occurred prior to settlement of the area.

Wildlife and Habitat

The Refuge is located in a transition zone, where coniferous forests, tallgrass prairie, and the prairie pothole region of the Red River Valley meet. It lies in the bed of glacial Lake Agassiz, resulting in a very flat terrain, and is dominated by expansive wetlands.

A diversity of wildlife species inhabits the Refuge, including 287 bird species, 49 mammals, 12 amphibians, and nine reptiles. A large Franklin's gull colony of approximately 20,000 breeding pairs is located on the Refuge. Agassiz is one of only a few Refuges in the lower 48 states with resident packs of gray wolves. The resident moose herd of approximately 100 animals has long attracted Refuge visitors from many states and countries.

Management Activities

Except for the 4,000-acre Wilderness Area, Refuge habitats are actively managed.

WATER MANAGEMENT: Refuge wetlands are managed in 22 pools, ranging in size from 100 to 10,000 acres, through a complex system of dikes and water control structures. Management interfaces with Watershed District and State Department of Natural Resources wetlands and flooding issues. Pools are managed at various water levels from total drawdowns to full pool levels, simulating natural wet and dry cycles. Large pools are in total drawdown every 10 years; others every 4 to 6 years. Management is focused primarily on providing habitat for waterfowl broods and over-water nesting waterfowl, such as canvasbacks, ring-necked ducks, ruddy ducks, and redheads.

FIRE MANAGEMENT: Refuge staff use controlled fire to discourage willow and other undesirable woody species on 1,000 to 10,000 acres of grassland each year. Burning keeps the areas open for waterfowl nesting. Fire is used in wetlands to enhance waterfowl habitat by breaking up dense stands of vegetation. It also helps maintain areas of young willow habitat to provide food for moose and white-tailed deer. These species are the primary prey of wolves. Burning of reclaimed cropland stimulates native grasses. Oak-savannah habitat is maintained through periodic burning.

PRIVATE LANDS: The Refuge is actively involved in restoring wetlands on private lands and working with other agencies in identifying wetlands, monitoring restored wetlands, and enforcing wetland regulations in seven counties.

WILDLIFE PROGRAMS: Annual censuses are conducted on breeding waterfowl, waterfowl broods, Franklin's gulls, several waterbird species, songbirds, deer, moose, and amphibians. Periodic surveys are conducted on wolves, black terns, and geese. Up to 1,200 mallards are banded each year. Recent and current research projects on the Refuge focus on moose, wolves, American and least bitterns, contaminants, and wilderness.

History

Historically, this area was a paradise for waterfowl and other wildlife. In 1910, in an effort to improve farming operations, an extensive drainage project was approved by Marshall County. By 1933, approximately one million dollars had been spent trying to drain the Mud Lake area. Farming proved unsuccessful. Marshall County become so tax delinquent that the State Legislature protected the County from bankruptcy but, in return, retained the right to use the lands for conservation purposes. The State negotiated the land transfer to the National Wildlife Refuge System in 1937.

Getting There . . .

The Refuge headquarters is located on Marshall County Road 7. From Thief River Falls, Minnesota, take Highway 32 North for 12 miles to the town of Holt. At Holt, turn east onto Marshall County Road 7 for 11 miles. The Refuge headquarters is located on the left (north) side of the road.

Recreation & Education Opportunities

Environmental Education

Tours and educational programs are given upon request. Special events such as satellite transmission of Fish and Wildlife Service outdoor classrooms are arranged. The Refuge has hosted and is involved in the regional Envirothon. Various educational trunks, posters, videos, etc., are available for school use.

Hunting

Deer hunting is allowed in accordance with Minnesota's deer firearm season regulations and special Refuge regulations. An accessible stand is available upon request.

Interpretation

Lost Bay Habitat Drive is a four-mile, self-guided, auto drive. Headquarters Hiking Trail is a half-mile, self-guided, foot trail. Interpretive kiosks are located on Marshall County Road 7 and at Refuge headquarters. A small visitor contact station at the headquarters has displays and mounts. The Refuge hosts open houses with special events in the spring and fall. The public is invited to help with capturing and banding ducks each summer.

Wildlife Observation and Photography

Agassiz is routinely listed as one of the top 100 wildlife viewing areas in the lower 48 states. Wildlife viewing is best from May to October. The four-mile habitat drive, Marshall County Road 7, and roads bordering the Refuge provide ample wildlife viewing opportunities. In addition, two observation towers are located on Marshall County Road 7. There are two walking trails: one is a 0.5-mile universally accessible trail; the other is 0.25 miles.

Station: Agassiz National Wildlife Refuge
Project: Moose Management
Issue: Declining Moose Population in Northwest Minnesota
Roles:

Refuge Manager

As a refuge manager, you are an expert in wildlife and habitat protection and restoration. You use the best science and technology to monitor and care for wildlife, use a range of land management techniques to ensure suitable habitat, and provide opportunities for wildlife-dependent recreation for Refuge visitors. You work with neighbors, community organizations, and other partners to represent the interests of wildlife in land-use planning and development. You have the **final say** in questions of Refuge management and regulations. You also participated in fieldwork on the moose research project whenever requested by the research team which at times was daily.

Materials: moose hide (moose was shot in the early 1900's in NW Minnesota) and Statistics on Moose Deaths handout

Wildlife Biologist

As a wildlife biologist, you carry out a wide variety of duties associated with conserving fish and wildlife species, including population surveys, habitat restoration, reintroduction of endangered species, and evaluation of the impacts of Federal projects. A few specific examples of the work you do are monitoring the status of moose and wolf populations by doing aerial counts in the winter. You collect blood and fecal samples from captured moose for study. You also reconstruct wildlife habitats such as wetlands and tallgrass prairie lands, and partner with other conservation officials in the U.S. Geological Survey to study moose carcasses for parasites.

Materials: liver fluke (parasite found in many of the moose carcasses during the research project), and The Winter Deer Tick and The Deer Liver Fluke handout

Ranger

As a ranger you are responsible for providing to the public, interpretive and education programs on moose and wolves. You create trail brochures, informational handouts, and press releases. You organize special events and maintain the volunteer/intern program. You set up a web site to monitor the radio collared moose tracking system and helped advertise The Adopt-a-Moose program.

Materials: Adopt-a-Moose Program handout

Maintenance Worker

In almost every unit of the National Wildlife Refuge System, as a maintenance worker and mechanic you do everything from creating trails, mowing grass, removing snow, installing water control structures and wiring, and operating heavy equipment to repair buildings and vehicles, managing waste, cleaning numerous facilities, and even controlling invasive species. At Agassiz, you also maintained a fleet of older vehicles for researchers to use while studying moose. You helped researchers if they get stuck or stranded. You hauled moose carcasses to designated study sites and troubleshooted any equipment failure for the research project.

Materials: radio collar (actual collar from moose research at Agassiz Refuge) and Moose Research Design Handout

Office Clerk

As a clerical employee, you work throughout the Service. Although most of the jobs require computer operation and word processing skills, managers depend on you to track the budget and spending, purchase supplies, maintain files, greet visitors, and handle telephone calls. You also perform specialized functions in the areas of personnel, procurement, and accounting. As part of the moose research project, you paid private contactors and partners, accepted donations and funding for the Adopt-a-Moose program, ordered equipment for the research team, and assisted with any mailing of samples collected by research team to independent research laboratories.

Materials: moose scat (used to study diseases)

Station: Agassiz National Wildlife Refuge
Project: Moose Management
Issue: Declining Moose Population in Northwest Minnesota
Results:

In 1998, Agassiz Refuge staff determined that the decline of the moose population in Northwest Minnesota does not appear to be caused by factors that their management actions can improve. Until the climatic factors are reversed that are making the moose range shrink to the north, we will probably see fewer moose in Northwest Minnesota.

The annual moose classification census at Agassiz Refuge was completed November 17, 2005. Only 19 moose were found in the sample blocks representing approximately 60 percent of the survey area. Based on this data, the population estimate is only 44 moose, which is down from the 70 to 80 moose that the surveys had been indicating since 1998.

Station: Tamarac National Wildlife Refuge
Project: Visitor Use and Refuge Compatibility
Issue: Visitor Opportunities vs. Resource Needs
Background:

Each year, approximately 35,000 individuals visit Tamarac NWR, with 80% of the visitation occurring between May and October. Much of the prime wildlife habitat and many of the historical sites at Tamarac NWR are located within the boundaries of the Sanctuary Area, which comprises the majority of Refuge lands. The Sanctuary is closed from March 1st to August 31st, which coincides with the breeding season for wildlife. One of the resident wolf packs uses land within the Sanctuary as a breeding and rearing area for its pups.

The open season for the Sanctuary coincides with hunting seasons for migratory waterfowl, deer, upland game birds, and small mammals. Even though there has only been one hunting accident in recorded Refuge history, non-hunting visitors feel unsafe about using the Sanctuary area during its open season, and they also don't want to disturb the hunters.

There have been many requests for opportunities for wildlife watching, fishing, photography, hiking, mushroom and berry picking, and visiting historical sites within the Sanctuary area during its scheduled closed times.

The Sanctuary Area includes lands and access roads (which can be used as hiking trails) north of County Road 26 which are **closed to the public from March 1 through August 31** to give resident wildlife a sanctuary during the breeding season. The Visitor Use Area south of County Road 26 is available for public use and is **open year-round** to all permitted activities.

Your team represents the staff of Tamarac National Wildlife Refuge. As a team, review and discuss the information provided about the Refuge and its recreational opportunities. Determine how you will deal with the public's requests to visit the Sanctuary area during its scheduled closed times. Select one or two staff to report your answers to the class.

1. **Will you allow the public to visit the Sanctuary Area during its scheduled closed times? If so, how much of it will be open? If not, what will you do?** You can be creative but also realistic.
2. **Why?** Be sure to remember the mission of the Refuge System, the purpose of your station, public safety, and scientific justification.
3. **Explain how each staff person will be involved.**

Tamarac
National Wildlife Refuge

35704 County Highway 26
Rochert, MN 56578

Visit the Refuge's Web Site:
http://midwest.fws.gov/tamarac

Timber wolves are occasionally seen at Tamarac Refuge.

Overview

Tamarac National Wildlife Refuge

Tamarac National Wildlife Refuge covers 42,724 acres and lies in the glacial lake country of northwestern Minnesota in Becker County, 18 miles northeast of Detroit Lakes. It was established in 1938 as a Refuge breeding ground for migratory birds and other wildlife.

Refuge topography consists of rolling forested hills interspersed with lakes, rivers, marshes, bogs and shrub swamps. The token of the Refuge is the tamarac tree. This unusual tree is a deciduous conifer, turning a brilliant gold before losing its needles each fall.

Tamarac lies in the heart of one of the most diverse vegetative transition zones in North America, where northern hardwood forests, coniferous forests and the tall grass prairie converge. This diversity of habitat brings with it a wealth of wildlife, both woodland and prairie species.

An attractive visitor center offers a spectacular vista of the marshes and trees that are typical of the Tamarac Refuge. A theater presentation provides orientation to the life and legends of this unique area.

Getting There . . .

The Refuge office/visitor center is located 18 miles northeast of Detroit Lakes, MN, at the junction of County Roads 26 & 29.

Wildlife and Habitat

Refuge wildlife consists of over 258 species of birds and 50 species of mammals. Spring on the Refuge attracts a magnificent warbler migration, and fall is highlighted with an abundance of waterfowl, including more than 15,000 ring-necked ducks at its peak.

Vegetation and wildlife are diverse due to the Refuge's location in the transition zone between northern hardwood and coniferous forests. Sixty percent of the Refuge is forested. Aspen, jack pine, red pine, balsam fir, paper birch, red and white oak, sugar maple and basswood are dominant types.

The tallgrass prairie begins about 10 miles west of Tamarac. Numerous pockets of native big bluestem remain on the Refuge, indicating that historically, the tallgrass prairie extended into the Refuge. About 1,500 acres of Tamarac are grassland, mostly remnants of early settler clearings or small farms. Wildflowers abound through the spring and summer seasons.

Bald eagles are common, with up to 23 pairs producing as many as 33 young in recent years. Trumpeter swans were reintroduced to the area in the early 1980s and now produce as many as 48 cygnets annually.

Visitors often see common loons, red-shouldered and broad-winged hawks, marsh wrens, red-necked grebes, kingfishers, common yellowthroats, and eastern bluebirds. The sounds of drumming ruffed grouse, red-winged blackbirds and wood frogs are plentiful in the spring.

Two packs of gray (timber) wolves find their home in the Refuge. Rarely seen are the few moose that roam the shrub swamps. Mammal sightings can include porcupine, mink, fisher, otter, beaver and badger.

History

Historically, the Refuge was a prized hunting, fishing, ricing, and maple sugaring area for Native American Indian tribes.

The Dakota once controlled the area, followed by the Chippewa. Today, the northern half of Tamarac lies within the original White Earth Chippewa Indian Reservation established in 1867. Historical sites throughout the Refuge chronicle the tribes' utilization and numerous battles fought over these precious resources. Still today, tribal members hunt, fish, trap and harvest herbs, berries and wild rice on the Refuge.

Between 1890 and 1930, the Refuge's original stands of red and white pine were logged. These logs were sent down the Egg, Buffalo and Ottertail rivers. Settlers arrived, but farming never achieved much prominence due to the thick forest, marginal soils and numerous wetlands.

In 1938 an Executive Order established the Tamarac National Wildlife Refuge. However, it was not until 1965 that all land acquisitions were completed. Tamarac's nearly 43,000 acres were purchased with funds from the sale of Federal Duck Stamps. Early Refuge development was achieved by a Conservation Corps Camp in the 1930s and further enhanced in the 1960s by a Job Corps Center.

Management Activities

Tamarac Refuge is in a "near pristine" state, and management activities are primarily directed at maintaining a diverse forest through timber harvesting, particularly of aspen. Some water management is possible and is aimed at maximizing wild rice production for migrating waterfowl. Limited controlled burning is done to maintain existing grasslands for waterfowl nesting. Resident wildlife and migratory bird surveys are used to monitor those populations. Waterfowl banding of mallards and wood ducks occurs annually.

Recreation & Education Opportunities

Environmental Education

School groups are welcome. The various habitats provide a wonderful classroom for many educational group activities.

Fishing

Several lakes are open for fishing throughout the year. Two sites along the Otter Tail River are also open for bank fishing. A universally accessible pier is located by the boat ramp on Many Point Lake. Consult the Refuge's Fishing Map and Regulations leaflet and the Minnesota Department of Natural Resources Fishing Regulations booklet, or White Earth regulations for more detailed information.

Hunting

The Refuge offers opportunities for hunters during the fall and winter months. Consult the Refuge's Hunting Map and Regulations leaflet and the Minnesota Department of Natural Resources, Hunting and Trapping Regulations booklet, or White Earth regulations for more detailed information.

Interpretation

Interpretive programs may be offered during the summer season. For more information, please contact the Refuge office. The Refuge visitor center offers interpretive displays about Refuge wildlife.

Wildlife Observation and Photography

The Refuge abounds with wildlife-viewing opportunities, and over 250 bird and 50 mammal species have been recorded here since 1938. Lakes, rivers, and wetlands provide homes for countless species of fish, reptiles, and amphibians. Near woodlands and grasslands, you will find butterflies, moths, insects, and other creatures. Leaf color during the fall season is spectacular! Hiking trails and the auto tour route allow quick access to scenic areas. A bird checklist is available.

Station: Tamarac National Wildlife Refuge
Project: Visitor Use and Refuge Compatibility
Issue: Visitor Opportunities vs. Resource Needs
Roles:

Ranger

As a ranger for the U.S. Fish and Wildlife Service at Tamarac National Wildlife Refuge, your primary responsibility is to educate the community about Service programs, coordinate fishing and hunting programs, and lead tours, nature walks, and environmental education events. You also coordinate your station's volunteer program. As a U.S. Fish and Wildlife Service employee, your first priority is wildlife, but you must also provide good customer service, balancing the public's desire to participate in recreational activities against the needs of wildlife. Many of the volunteers and regular visitors are your friends, and you often hear requests from them and from the visiting public to visit the Sanctuary area outside of its open season.

Materials: Visitor use statistics, comments from guest book, Refuge map

Refuge Manager

Refuge managers are experts in wildlife and habitat protection and restoration. You use the best science and technology to monitor and care for wildlife, use a range of land management techniques to ensure suitable habitat, and provide opportunities for wildlife-dependent recreation for Refuge visitors. You spend a lot of time meeting with Refuge neighbors (including representatives from the White Earth reservation), community organizations, and other partners to represent the interests of wildlife in land-use planning and development. As Refuge Manager, you have the **final say** in questions of Refuge management and regulations. You have recently moved from a popular Refuge in an urban area with high visitation, which included many opportunities for public recreation. Your supervisors in the Regional Office are pressuring you to get the word out about your Refuge while still putting wildlife first.

Materials: Refuge map

Refuge Officer

As a Refuge law enforcement officer, your responsibility is to protect wildlife from poaching and ensure the safety of visitors to National Wildlife Refuges. You are very familiar with wildlife laws and Refuge regulations, and you enforce the law. Sometimes violators receive a fine, and other times you take the opportunity to educate them about why what they're doing harms wildlife. It is your job to enforce regulations regarding visitation and hunting in the Sanctuary Area. You are an avid hunter and fisherman, and you are enthusiastic about seeing more hunting and fishing opportunities in the area. You know many of the local hunters and anglers.

Materials: Hunting map and regulations, Refuge map

Wildlife Biologist

As a wildlife biologist, your primary responsibility is to conserve fish and wildlife species. You conduct population surveys, habitat restoration projects, reintroduction of endangered species, and evaluation of the impacts of Federal projects. At Tamarac, your focus is on monitoring songbird, waterfowl, and wolf populations. You have been studying the wolf population for many years, and are very familiar with their habits and land use. You are also concerned with songbird species that are declining in the state and are known to nest in the Sanctuary area (i.e. golden-winged warbler). You are extremely concerned that by increasing visitor use and access to the Refuge, you will turn the Refuge into a park and negatively impact the wildlife.

Materials: Refuge map

Maintenance Worker

On almost every wildlife Refuge, maintenance workers do everything from creating trails to installing wiring. At Tamarac, you do many of the hands-on management tasks under the direction of the refuge manager. For example, you maintain roads and trails for public use, install and maintain boundary signs and gates, plant prairie seeds, and maintain and operate heavy equipment.

Materials: Refuge map

Visitor Use Statistics 2004
Tamarac National Wildlife Refuge

Statistics

35,000 people per year visit Tamarac National Wildlife Refuge.

80% of visits occur between May and October. (Sanctuary Area is closed most of this time.)

Sample Comments from Guest Book

(Note: these comments are fictional and were created for the purpose of this educational program.)

"My wife and I would really like to visit the Osprey Nest east of the Chippewa Trail – is there any way that you could open that area to the public during June and July?"

- Robert B., Detroit Lakes, MN

"This Refuge is great for waterfowl viewing, but I am really interested in bring members of my Audubon group to view waterfowl on North Chippewa Lake in late March. Why is the area closed at that time?"

- Joan S., Fargo, ND

"My family and I were hoping to see wolves – we wish more of the Refuge was open!"

- Norman L., Omaha, NE

Station: Tamarac National Wildlife Refuge
Project: Visitor Use and Refuge Compatibility
Issue: Visitor Opportunities vs. Resource Needs
Results:

Tamarac National Wildlife Refuge staff are currently addressing the issue of the public request for access to the Sanctuary Area during summer months. As such, the issue has not been completely resolved at this point.

Research is being conducted to determine why the Sanctuary area was historically set aside as protected land. Wildlife biologists at the Refuge are monitoring populations and nesting or breeding success of key wildlife species, including the gray wolf, trumpeter swan, bald eagle, and more, as well as waterfowl species nesting on the Refuge.

In addition to collecting visitor use statistics and serving as the liaison to the public, the ranger has been conducting research to determine historical use of the land before the Refuge was established. It has been determined that the southern portion of the Refuge (the visitor use area) was originally owned by a sporting club. When the land was purchased by U.S. Fish and Wildlife Service, agreements were reached that recreational activities would be allowed in that area. The ranger is also looking at studies conducted at other natural areas to determine the impact of visitor use on wildlife and land resources.

Refuge law enforcement is responsible for dealing with encroachments on closed Refuge lands. When dealing with visitors found in the Sanctuary during the closed season, the officers gather information about why they were in the area (Didn't see the sign? Wrong information or lack of signage at entrance point? Knowingly trespassed?) That information is then passed on to Refuge management. If signs need to be added to the Refuge, the maintenance worker will install them.

Tamarac NWR staff are considering the possibility of opening portions of the Sanctuary for hiking, wildlife watching, and other recreational activities during the closed season. Wauboose and Lost Lake are both open for fishing during the closed season. The National Park Service has established a hiking trail (the North Country National Scenic Trail) that traverses the nation from New York to North Dakota. Details of the final trail route are being set and the trail coordinators have requested that the trail go through the Sanctuary from the north to south. This is a primitive trail for hiking only so no bikes, snowmobiles, or other vehicles are allowed. Most of the trail use will be in the summer. Refuge staff are also considering this possibility.

Minnesota Valley National Wildlife Refuge

3815 American Blvd. East
Bloomington, MN 55425

Visit the Refuge's Web Site:
http://www.fws.gov/midwest/MinnesotaValley

Minnesota Valley National Wildlife Refuge counts the Minneapolis-St. Paul International Airport, the Mall of America, and Valley Fair Amusement Park among its urban and suburban neighbors.

Overview

Minnesota Valley National Wildlife Refuge

Minnesota Valley National Wildlife Refuge is located within the urban and suburban areas of Minneapolis and St. Paul. It is a green belt of large marsh areas bordered by office buildings, highways, residential areas, and grain terminals.

The Refuge is comprised of eight linear units totaling approximately 13,500 acres, spanning 34 miles of the Minnesota River. The focal point of the Refuge is the visitor center, which features 8,000 square feet of exhibit space, an auditorium, two classrooms, a bookstore, an art gallery, and an observation deck.

The Refuge uniquely affords a large metropolitan populace wide expanses of marshes and floodplain forests offering superb birding, wildlife viewing, fishing, hunting (in certain areas), and outdoor education and recreation experiences. The Refuge is staffed by 23 employees.

Getting There . . .

From I-494, exit on 34th Ave. and drive south. Turn left on American Blvd. East and drive 1/4 mile to the entrance on the right. The Visitor Center is located at 3815 American Blvd. East in Bloomington, across from the Airport Hilton Hotel.

Wildlife and Habitat

Minnesota Valley Refuge habitats include riverine wetlands, fens, seeps, floodplain forests, oak savannas, forest, and native grasslands. Refuge visitors experience a diversity of habitat and wildlife. In all, more than 250 species of birds, including nesting bald eagles and peregrine falcons, use the Refuge at some time during the year. This avian diversity is complemented by at least fifty species of mammals and thirty species of reptiles and amphibians. Common sightings include white-tailed deer, red fox, muskrat, beaver, wood chuck raccoon, leopard frog, green frog, and painted and snapping turtles.

History

Some ten thousand years ago, the wide-spanning glaciers of the Ice Age melted into torrential rivers, the largest being the impressive River Warren. The Minnesota River, which meanders through the enormous trenches left behind by the ancestral River Warren, spans southern Minnesota before converging into the Mississippi River.

In 1934, Theodore Wirth, recognizing this verdant treasure, helped launch a plan to preserve a large expanse of the lower Minnesota River Valley. However, World War II interrupted this initiative, and it was not until the 1970s that a group of citizens picked up the banner for the preservation of the valley, then threatened by development. Through these citizens' efforts, legislation was enacted in 1976 to establish the Minnesota Valley National Wildlife Refuge.

Management Activities

Minnesota Valley National Wildlife Refuge contains a variety of habitats that are actively managed to benefit the many wildlife species who utilize them. Refuge staff manage and restore these habitats through biological control, prescribed burning, water control structures, hydroaxing, invasive plant removal, integrated pest management, seeding, planting, encouraging natural regeneration, and working cooperatively with neighboring cities, land management agencies, and organizations.

Recreation & Education Opportunities

Environmental Education

Interpretation and environmental education were mandated by the Refuge's establishing legislation. The Refuge offers a full array of environmental education opportunities, including on-site programs for students in preschool through 12th grade. Program topics range from specific plant or animal species to broader concepts, such as habitats and watersheds. Each program is unique and challenges all students to reflect on daily interactions with their natural environments, garnering increased respect for those environments.

Interpretation

Interpretive programs and special events are offered year round at the Minnesota Valley National Wildlife Refuge. From wildlife programs given up and down the valley, to volunteers interacting with groups on the various Refuge units, to non-personal interpretation provided by signs, brochures, and our website, our interpretive mandate remains: protect the Refuge by acting as catalysts for interaction between people and the land because people only protect what they know and love.

Fishing

Unless posted with an 'Area Closed' sign, bank fishing is permitted throughout the Refuge in accordance with Minnesota State Regulations. Boats are not allowed on Refuge waters except for waterfowl hunting and trapping. No motorized boats. Accessible fishing piers are located on the youth fishing pond in the Bass Ponds section of the Long Meadow Lake Unit and also near the Old Cedar Avenue Parking Lot.

We recommend you practice catch-and-release fishing on the Refuge because every lake, marsh, and creek is impacted by storm sewers and agricultural runoff. Please consult Minnesota State Health Department guidelines before eating any species. Call 651.215.0950 for a copy of their fish consumption advisory booklet.

Hunting

All Minnesota State regulations are enforced. The following types of hunting are permitted: shotgun and muzzleloader deer, bow and arrow deer, small game, migratory waterfowl, turkey, and trapping. You may only hunt, fish, or trap in specified areas and during specified times. Each activity is also subject to the special Refuge regulations. For details, contact the Refuge.

Wildlife Observation and Photography

Bring your binoculars to Minnesota Valley as a variety of seasonal opportunities exist to observe wetland, river, and upland wildlife. The Refuge has three nature photography blinds that may be reserved for seasonal use by the general public. The blinds are located in the Wilkie Unit, the Chaska Unit, and the Upgrala Unit.

Station: Minnesota Valley National Wildlife Refuge
Project: Airport Expansion
Issue: Mitigation of Negative Impacts
Background:

The Federal legislation which established Minnesota Valley National Wildlife Refuge (MN Valley) includes a requirement that the Service will not try to stop transportation projects that impact the Refuge. This legislation supercedes the wildife-first mission of the National Wildlife Refuge System.

A proposal from the Metropolitan Airport Commission (MAC) has been presented to MN Valley, a field station for the U.S. Fish and Wildlife Service (Service), for an expansion of the Minneapolis-St. Paul International Airport in Bloomington, MN.

The expansion calls for a new north-south runway (Runway 17/35) parallel to 24th Avenue in Bloomington, MN. The flight pattern for the proposed runway would be directly over the Long Meadow Lake Unit of the Refuge, particularly the Bass Ponds access site. (Refer to map for details.)

This is a negative impact for the Refuge. Some of the repercussions include noise pollution, wildlife dispersal, and decline/shift in bird migration. There has been little research conducted about noise pollution and its effects on wildlife. The results are inconclusive.

The Service has never had another similar situation in the history of existence, due to MN Valley only being one of four urban Refuges of over 545 Refuges nationwide and the closet Refuge in proximity to an international airport. Although MN Valley must absorb impacts from transportation, that impact must be mitigated (made less severe) by MAC.

As an employee of the Service in the Fort Snelling Regional Office, Ecological Services Field Office, or at the Refuge, what will you do to mitigate the negative impacts runway expansion will have on the Refuge? Discuss and answer the following questions together. Select one or two staff to report your answers to the whole class.

1. **What will you do to mitigate the negative impacts runway expansion will have on the Refuge?** You can be creative but also realistic.
2. **Why?** Be sure to remember the mission of the Refuge System, the purpose of your station, public safety, and scientific justification.
3. **Explain how each of your staff will be involved.**

Station: Minnesota Valley National Wildlife Refuge
Project: Airport Expansion
Issue: Mitigation of Negative Impacts
Roles:

Refuge Manager

In every wildlife Refuge, refuge managers oversee the operation and mission of their National Wildlife Refuge. You have the **final say** in questions of Refuge management and regulations. At Minnesota Valley National Wildlife Refuge, you provide administrative and managerial leadership in the operation of the Refuge. You plan, execute, and evaluate all projects dealing with the Refuge including wildlife habitat development, maintenance, protection, and enhancement; public use activities compatible with a urban Refuge; and serve as the Service's primary representative for other agencies/organizations within the Twin Cities Area. As the manager for this urban Refuge, you also have many years of experience in wildlife/urban interface (housing developments next to the Refuge) and high profile natural areas throughout the nation (acquiring land and enforcing federal fish and wildlife policies). You have a deep passion for this issue.

Wildlife Biologist

You are in charge of developing and reviewing comprehensive wildlife management plans. All other Refuge programs (fire management, public use) that affect biological resources have to be coordinated with you. Working at Minnesota Valley National Wildlife Refuge provides a wide variety of complex investigations (such as storm water runoff, Refuge land contaminations, water quality) that you design and for which you collect and analyze biological data. These investigations could also include reviewing and analyzing biological implications of environmental assessments or comprehensive resource planning including noise pollution on the Refuge from the Runway 17/35 expansion. Being a local citizen, you are a member of the Minnesota Valley Audubon Chapter and have been hearing many negative comments from other members about bird migration—your fellow birders want to know how the runway will affect bird pollutions on the Refuge and nearby natural areas (Fort Snelling State Park, Nine Mile Creek).

Executive Director, Friends of Minnesota Valley

You are not an employee of the Refuge. You are the executive director of the non-profit Friends of Minnesota Valley citizen group for the Refuge and for all natural areas along the lower Minnesota River Valley. You were hired through the board of directors about two years ago to oversee the daily operation and administration of the Friends group. As the Friends spokesperson, you provide leadership and excellent communication skills and serve as a major advocate for all environmental issues concerning the Refuge in addition to the lower Minnesota River. One of your main qualifications is that you are a licensed lawyer in the state of Minnesota and have many professional contacts with dignitaries throughout the state and nation. Another major duty with your job includes providing a means for accepting and managing contributions (monetary, in-kind, and voluntary) for implementing the mission of the Refuge. Your office is located within the Refuge headquarters.

Twin Cities Ecological Services Staff

You work for the U.S. Fish and Wildlife Service in a separate office neighboring the Refuge visitor center, but you are not a member of the Minnesota Valley National Wildlife Refuge staff. You are in charge of administering the Endangered Species Act, identifying sources of environmental contamination, assessing impacts and helping in restoring contaminated fish and wildlife habitat, and ensuring that fish and wildlife resources are considered during planning and construction by Federal agencies that build roads, bridges, dams, etc. You are especially concerned with Minnesota Valley National Wildlife Refuge and the new Minneapolis-St. Paul International Airport runway expansion project. Since the Refuge is located next door to your office, you have a great working relationship with the Refuge staff and would like to be a part of this issue.

Regional Refuge Supervisor

You supervise refuge managers in two states (MN and WI) within the Midwestern eight-state Region 3 of the National Wildlife Refuge System. Directing policy and staff functions in Refuges is your main duty including coordinating region-wide issues/policies to your Refuges and evaluating regional precedents and their impact on Refuge policy and procedures. You possess managerial and leadership skills in integrating multiple aspects of habitat management, Refuge management, and visitor services management. You provide guidance and assistance for the refuge manager, particularly helping them review, formulate, and influence the establishment of polices, plans, federal and regional programs, and procedures for the National Wildlife Refuge System. Your office is located on the opposite side of the airport from the Refuge in the Federal Building at Fort Snelling.

Regional Chief, National Wildlife Refuge System

You are one of eight regional chiefs that work for the U.S. Fish and Wildlife Service across the country. You direct, plan, and implement all policies and procedures from the U.S. Fish and Wildlife Service for the National Wildlife Refuge System in the Midwestern eight-state Region 3. You supervise regional refuge supervisors, refuge operations, the Private Lands Division, the Conservation Planning Division, and the Budget and Administration Division for the National Wildlife Refuge System in Region 3. Your contact with individual Refuges (including Minnesota Valley) mostly takes place for review of the individual Refuge or when a major issue takes place (such as airport runway expansion). Your office is located on the opposite side of the airport from the Refuge in the Federal Building at Fort Snelling.

Regional Director

You administer the Midwestern eight-state Region 3 within the U.S. Fish and Wildlife Service. Your major duties are directing policy and coordinating national and regional wide issues/policies along with evaluating national precedents and their impact on Regional policy and procedure. You supervise every division within Region 3, and you possess strong managerial and leadership skills in integrating multiple aspects of the ecosystem approach to management, Refuge management, ecological services management, and fisheries management. On a personal level you have an extraordinary passion for conservation.

Materials: Each student will be provided with an area map of the Refuge.

Station: Minnesota Valley National Wildlife Refuge
Project: Airport Expansion
Issue: Mitigation of Negative Impacts

Results:

Three major entities negotiated the mitigation of the airport expansion: the Metropolitan Airport Commission (MAC), the Federal Aviation Administration (FAA), and the U.S. Fish and Wildlife Service (Service).

With the approval by the State Legislature of MAC's runway expansion at a cost of $2.7 billion, the regional director informed Service staff and MAC and the FAA of the role the Service wanted to have concerning mitigating impacts of this issue. The Refuge manager prepared the written mitigation proposal and the regional director signed and mailed it.

In their official capacity, the regional director and regional chief played roles on the political end of the issue. They informed local and state delegates, attended some meetings in Washington D.C. in order to justify Service actions, informed them of potential impacts, and received support from the Service and the Department of the Interior. In a political role, the Friends of MN Valley however could legally lobby politicians to advocate for compensation of losses to the Refuge.

Negotiations on Refuge mitigating impacts between the U.S. Fish and Wildlife Service (Service) and MAC began in 1997. The Service received support from many conservation groups to aid in mitigation including Friends of Minnesota Valley, Audubon Society, Izaak Walton League, and The Nature Conservancy. Throughout the process, the Refuge manager participated in negotiation meetings and wrote additional official letters. Initially the Refuge intended to advocate for mitigation to wildlife due to noise and to visitors. The Refuge biologist researched impacts to wildlife but found the research difficult to tie to quantitative results. Impacts to humans were well documented however and the Refuge succeeded in mitigating those impacts.

In 1998, after months of negotiations, an agreement was made for cash settlement of $26.9 million. This agreement represents the first time in the history of the Service a settlement went directly to the field station it affected by the issue, Minnesota Valley National Wildlife Refuge.

In order to make sure the money would be protected from government absorption, a Trust Incorporation was created in 2000. The Minnesota Valley Trust Inc. (Trust) is administrated by a five member organization and MAC. Trust funds are invested in the stock market. The Trust board has delegated the money to be spent on a new visitor and environmental education center and land acquisition. The Refuge manager participates in Trust board meetings as the Service employee liaison, and the executive director of the Friends of MN Valley serves as one of the Trust board members. Daily

situations involving the Trust board are handled by the assistant Refuge manager with support from the ranger.

Land acquisition has been the responsibility of the refuge operations specialist. Since the Trust's creation, over 650 acres of lands has been acquired for the Refuge. The amount of this acreage will increase over time to a minimum of 4,090 acres of lands. A new maintenance shop, staff housing and two pole barns have been constructed. Seasonal/volunteer bunk housing and visitor and education center construction has started and will tentatively be completed by January 2007. These facilities are all located on the southern most unit of the Refuge, the Rapids Lake Unit in Jordan, MN.

Station: Minnesota Valley National Wildlife Refuge
Project: Airport Expansion
Issue: Mitigation of Negative Impacts
Detailed Results:

Summary

- Early 1990s, Runway 17/35 to be built at MSP, directs planes over Refuge
- 1997 negotiations b/w the Service and MAC on Refuge impacts
- Support from many conservation groups to mitigate for the impact, esp. the Friends Group
- 1998 MOA b/w MAC and the Service for cash settlement

Role of the Trust

- MOA b/w the Service and MAC provided for creation of Trust to hold and administer money
- Protect money from being absorbed by the government
- 2000 Trust Articles of Incorporation
- 2000 MN Valley Trust Agreement signed by 5 member organizations and MAC
- 2001 Funds invested by Trust Board (**26.09 million**)
- Trust responsible for implementation of mitigation activities through project proposals

Mitigation Plan based on wording from Agreements

Mitigation activities to be accomplished by the Trust include but are not limited to:

1. Acquisition of a minimum of 4,090 acres of lands within the are identified as appropriate, and making such lands available for Refuge environmental education and wildlife dependent recreational opportunities either through donation to the U.S. to be administered by the Service or its successor as part of the Refuge, or though a cooperative or other agreement for such use at no cost to the U.S.
2. Construction and development of a visitor and education center on the Rapids Lake Unit or another suitable location approved by the Service or its successor for the Refuge; and
3. Construction of visitor access, environmental education, and wildlife interpretive facilities at suitable locations approved by the Service or its successor on Refuge lands.

Refuge Mitigation Plan

Tool to implement the direction from agreements

- Developed during the CCP process
- Refuge mitigation plan is part of the CCP
- Land Protection Plan is part of the CCP
- Plans go through public review process
- 2002 and 2003 Trust Board comments on Plan
- 2002 Friends of MN Valley comments on Plan

- April 4, 2002 Refuge Mitigation Plan approved by Trust Board
- Sept 15, 2004 CCP including Mitigation Plan and Land Protection Plan signed

Rapids Lake Unit Development

- Plans for construction of new shop facilities, LE housing, Visitor center and seasonal/volunteer bunkhouse.
- 2005 Completion of Maintenance Shop, 2 pole barns, and staff housing (Law Enforcement)
- 2005 road construction implemented for access to Visitor Center
- *Bunkhouse to be completed October 2006
- *Visitor Center to be completed January 2007

*These dates are tentative

Station: Minnesota Valley National Wildlife Refuge
Project: Airport Expansion
Issue: Mitigation of Negative Impacts
Complete MAC Expansion Report:

As a result of the Minnesota Legislature's 1996 decision to expand MSP at its present site rather than build a new airport, the Metropolitan Airports Commission is implementing MSP 2010: Building a Better Airport. Many improvements have already been completed through the $2.7 billion program, including:

- Thirty new regional gates on new concourses A and B
- Development of the award-winning Northstar Crossing dining and shopping space
- New airport roadways
- The addition of 6,500 parking spaces at the Lindbergh Terminal and 4,700 spaces at the Humphrey Terminal
- Twelve additional jet gates and a new food court on Concourse C
- A new, eight-gate Humphrey Terminal (since expanded to 10 gates)
- New auto rental facilities
- A Skyway Connector linking concourses C and G, parking, auto rental, and mass transit facilities
- A new transit center, providing access to mass transit buses and shuttles to off-airport auto rental companies
- A climate-controlled tram, whisking people quickly from the Blue and Red parking ramps, auto rental facilities and Transit Center to the terminal and back
- Creation of children's play areas in the Humphrey Terminal and on Concourse C of the Lindbergh Terminal. The play areas were funded by the Metropolitan Public Airport Foundation, which also finances and administers the airport's Travelers Assistance program at MSP
- The switch to a more universally recognized alpha-numeric concourse and gate designation system, along with accompanying new signage
- Three new airfield deicing pads to accommodate end-of-runway deicing
- Runway pavement reconstruction on over 10,000 feet of 1960 vintage pavement
- Taxiway/apron pavement reconstruction
- $110 million of vehicular roadway tunnels
- Over 14 acres of storm water ponds